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PERFORMANCE ORIENTED PACKAGING TESTING
OF
SHIPPING AND STORAGE CONTAINER
FOR
ANTI-PERSONNEL OBSTACLE BREACHING SYSTEM

BY:

KERRY J. LIBBERT
MECHANICAL ENGINEER

Performing Activity:
Naval Weapons Support Center Crane
Crane, Indiana 47522-5000

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19 ABSTRACT (Continue on reverse if necessary and identify by block number) The shipping and storage container for the Anti-Personnel Obstacle Breaching System was tested for conformance to Performance Oriented Packaging regulations as specified in the United Nations Recommendations on the Transport of Dangerous Goods document, ST/SG/AC.10/1. The extruded sidewall aluminum container was tested with a gross weight of 230 pounds and met the requirements and retained its contents.					
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22a NAME OF RESPONSIBLE INDIVIDUAL Kerry J. Libbert			22b TELEPHONE (Include Area Code) (812) 854-1025		22c OFFICE SYMBOL 5053

INTRODUCTION

The shipping and storage container for the Anti-Personnel Obstacle Breaching System (APOBS) was tested to ascertain whether the container would meet the requirements of Performance Oriented Packaging (POP) as specified by the United Nations Recommendations on the Transport of Dangerous Goods Document, ST/SG/AC.10/1, Revision 6, Chapters 4 and 9. A base level vibration test was also conducted in accordance with the rulings specified in the Federal Register/Vol. 55, No. 246/Friday, December 21, 1990/Final Rule. The objectives were to evaluate the adequacy of the container in protecting the explosive materials.

The container is a rectangular, mid-opening, extruded aluminum sidewall design. Cushioning is provided by fire-retardant, static dissipative foam polyethylene. The container and dunnage are shown in Figure 1.

TESTS PERFORMED

1. Drop Test

This test was performed in accordance with ST/SG/AC.10/1, Chapter 9, Paragraph 9.7.3. One container was used throughout the test series. The drop height was 1.2 meters and the drop sequence was as follows:

- a. Flat on Bottom
- b. Flat on Top
- c. Flat on Long Side
- d. Flat on Short Side
- e. One Corner

The test was performed at ambient temperature ($70^{\circ} \pm 20^{\circ}\text{F}$). The contents of the container should be retained within its packaging and exhibit no damage liable to affect safety during transport.

2. Stacking Test

This test was performed in accordance with ST/SG/AC.10/1, Chapter 9, Paragraph 9.7.6. Three different containers were used, each with a stack weight of 2300 pounds. The test was performed for 24 hours. After the allowed time, the weight was removed and the container examined. Any leakage, deterioration, or distortion which could adversely affect transport or reduce its strength or cause instability in stacks of packages is cause for rejection.

3. Base Level Vibration Test

This test was performed in accordance with the Federal Register/Vol. 55, No. 246/Friday, December 21, 1990/Final Rule. Three sample containers were loaded with inert APOBS and closed.

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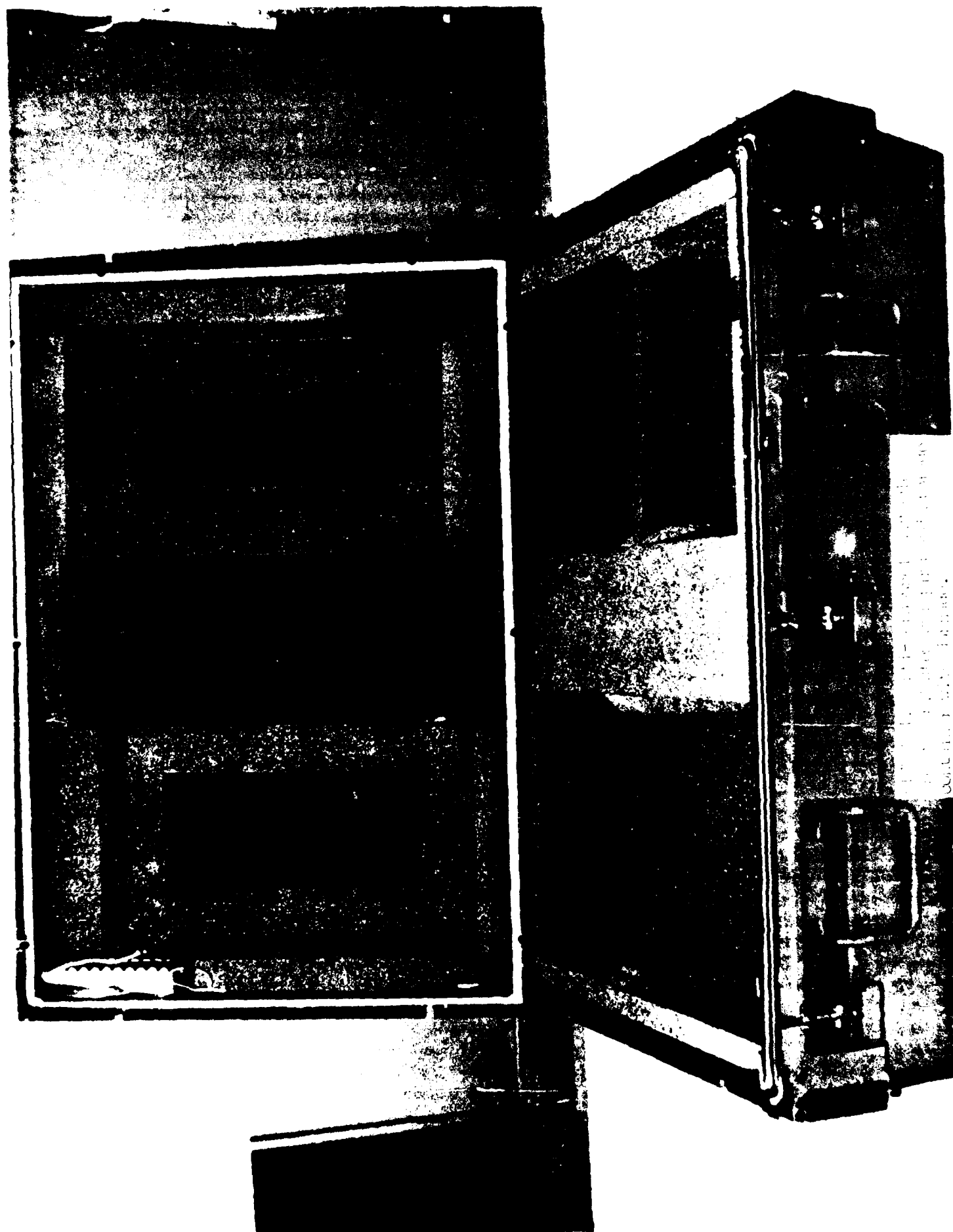
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as for shipment. Each container was placed on a vibrating platform that had a vertical double-amplitude (peak-to-peak displacement) of one inch. The packages were constrained horizontally to prevent them from falling off the platform, but were free to move vertically, bounce and rotate. The test was performed for one hour at a frequency that caused each point of the container bottom to be raised from the platform 1/16-inch. A 1/16-inch thick metal strip was passed between the bottom of the container and the platform.

TEST RESULTS

1. Drop Test

Satisfactory.

2. Stacking Test

Satisfactory.

3. Base Level Vibration Test

Satisfactory.

DISCUSSION

1. Drop Test

After each drop the container was inspected for any damage which would be cause for rejection. Final inspection revealed slight denting of the outer wall of the extruded walls, but the container remained intact and serviceable upon completion of the tests.

2. Stacking Test

Three containers were individually tested. Each container was visibly inspected after the 24-hour period was over. There was no leakage, distortion, or deterioration to the container as a result of this test.

3. Base Level Vibration Test

Immediately following the vibration test, each container was removed from the platform, turned on its side and observed for any evidence of leakage. All latches remained fastened and there was no evidence of leakage of contents.

PASS/FAIL (UN CRITERIA)

The criteria for passing the drop test is outlined in Paragraph 9.7.3.5 of ST/SG/AC.10/1 and states the following: "Where a packaging for solids undergoes a drop test and its upper face strikes the target, the test sample passes the test if the

entire contents are retained by an inner packaging or inner receptacle (e.g., a plastic bag), even if the closure is no longer sift-proof".

The criteria for passing the stacking test is outlined in Paragraph 9.7.6.3 of ST/SG/AC.10/1 and states the following: "No test sample should show any deterioration which could adversely affect transport safety or any distortion liable to reduce its strength or cause instability in stacks of packages".

PASS/FAIL (FEDERAL REGISTER CRITERIA)

The criteria for passing the Base Level Vibration Test is outlined in the Federal Register/Vol. 55, No. 246/Friday, December 21, 1990/Final Rule and states the following: "Immediately following the period of vibration, each package shall be removed from the platform, turned on its side and observed for any evidence of leakage. Rupture or leakage from any of the packages constitutes failure of the test".

REFERENCE MATERIAL

United Nation's "Recommendations on the Transport of Dangerous Goods", ST/SG/AC.10/1, Revision 6

49 CFR Part 107, et al. Performance Oriented Packaging Standards, Federal Register/Vol. 55, No. 246/Friday, December 21, 1990/Final Rule

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DATA SHEET

CONTAINER:

Shipping and Storage Container for the Anti-Personnel
Obstacle Breaching System

Type: 4B2

UN Code: 1.1D

Specification Number:
MIL-STD-648

Material:
Aluminum

Capacity:
54.5 kg
(120 pounds)

Dimensions:
1.12m L x .77m W x .44m H
(44.1" L x 30.2" W x 17.2" H)

Closure (Method/type):
Latches (10 ea.)

Tare Weight:
242.3 kg
(110 pounds)

Additional Description: Container is extruded aluminum
construction in accordance with drawing 01365-87012A5000;
dunnage is fire-retardant, static dissipative foam
polyethylene in accordance with PPP-C-1752, Class 3,
Grade D, Type 1.

PRODUCTS:

Anti-Personnel Obstacle Breaching System, EX7 Mod 0

Proper Shipping Name: Articles, Explosive, N.O.S.

United Nations Number: 0463

United Nations Packing Group: None

Physical State: Solid

Amount Per Container: One (1)

Net Weight: 54.5 kg (120 pounds)

TEST PRODUCT:

Name: Inert APOBS
Physical State: Solid

Size : Backpack: .56m L x .41m W x .33m H
(22"L x 16"W x 13"H)

Rocket/fuze pack: .64m L x .27m W x .17m H
(25.25"L x 10.5"W x 6.5"H)

Quantity : Backpack: Two (2)
Rocket/fuze pack: One (1)

Dunnage: Foam polyethylene, PPP-C-1752
Gross Weight: 104.4 kg (230 pounds)